

**REMARKS**

Claims 25-37 are pending in the application, and are rejected. Claims 25 and 37 are herein amended.

**Claim Rejections under 35 U.S.C. §103**

Claims 25-27, 29-30 and 32-37 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,266,355 B1 to Sverdlov in view of U.S. Patent No. 4,961,197 to Tanaka et al.

The Examiner notes that Sverdlov does not teach the cladding layer of first conductivity type to have a ridge portion. However, the Examiner asserts that it has been known in the art of Group III-V semiconductor light-emitting devices to include a ridge portion of several tenths of micron thickness in the upper cladding layer to increase light emission efficiency, as witnessed by Tanaka et al. (column 10, line 62 - column 11, line 24). The Examiner further asserts that motivation stems from the known advantage of increased light efficiency in laser apparatus.

The Examiner further asserts that the inclusion of the further limitation of the ridge portion in the independent claim 25 rather than in claim 29 does not place the present application in condition for allowance because of the presence of the teaching of a ridge portion of “several tenths of microns” of thickness in an upper cladding layer in Group III-V semiconductor light-emitting devices to increase light emission efficiency, as witnessed by Tanaka et al. (column 10, line 26 - column 11, line 24). The Examiner asserts that it is well known in the art to include a ridge portion to stabilize the fundamental lateral mode and thus increase the light emission efficiency, as mentioned in Tanaka et al.

Applicants herein amend claim 25. Subsequently, Applicants disagree with the Examiner's rejection, because not all of the claimed limitations are taught by the cited reference.

The Examiner's first assertion is that it is well-known in art of Group III-V semiconductor light-emitting devices to include a ridge portion of "several tenths of micron thickness" in the upper cladding layer to increase light emission efficiency. The Examiner cites Tanaka et al. (column 10, line 62 - column 11, line 24).

However, in column 4, lines 39-42 in Tanaka et al. teach that the portions of the upper cladding layer on which no ridge stripes are formed are 0.2-0.6  $\mu\text{m}$  thick, while the portion of the upper cladding layer on which the ridge stripe is formed is 1.0-3.0  $\mu\text{m}$  thick. In other words, the flat portion of the cladding layer is "tens of microns thick", as characterized by the Examiner, but the thickest portion of the cladding layer is 1-3  $\mu\text{m}$  thick, which is substantially more than the "less than 0.3  $\mu\text{m}$ " of the cladding layer as recited in the present claims.

Applicants admit that the claimed phrase, "the thickness of said cladding layer of a first conduction type being less than 0.3  $\mu\text{m}$ " as in claim 25 could be interpreted to mean that **a portion** of the cladding layer has such a thickness. As noted above, this is the case in Tanaka et al. However, Applicants note that the clear intention of the Inventors is that a maximum thickness of the cladding layer is less than 0.3  $\mu\text{m}$ . Therefore, to clarify the claims, Applicants herein amend claim 25 to recite that "the maximum thickness of said cladding layer of a first conduction type being less than 0.3  $\mu\text{m}$ ". Applicants believe that such amendment patentably distinguishes from the cladding layer of Tanaka et al.

Applicants teach the importance of this specific cladding layer thickness in the specification on page 6, line 10 to page 7, line 15, and on page 19, line 24 to page 23, line 5.

Applicants describe that the criticality of the 0.3  $\mu\text{m}$  cladding layer thickness limit is that in a nitride-based semiconductor laser, a ridge thickness exceeding 0.3  $\mu\text{m}$  causes an abrupt change in a vertical transverse mode, thus leading to an abrupt deterioration in characteristics. This problem is specific to the nitride-based semiconductor laser. With a ridge thickness of 0.3  $\mu\text{m}$ , the vertical transverse mode becomes a fundamental mode, which prevents the abrupt deterioration in characteristics. Therefore, the specific limitation of the cladding layer thickness is not even suggested by the cited reference.

In view of the presently presented preliminary amendment and accompanying remarks, Applicants submit that the claims are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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